



## **DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE**

**(Autonomous)**

**Reaccredited with A++ by NAAC(3<sup>rd</sup> Cycle)**

**College with Potential for Excellence,**

**Linguistic Minority Institution Affiliated to University of Madras**

**Arumbakkam, Chennai – 600 106.**

### **POST GRADUATE AND RESEARCH DEPARTMENT OF MATHEMATICS**

#### **Minutes of the Board of Studies- 2022 Meeting in M.Sc Mathematics**

The meeting of the board of studies in B.Sc Mathematics was convened on 21<sup>st</sup> July 2022 at 12:30 p.m in Seminar Hall-I (Main Block).

Prof. R. Venkataramanan, Associate professor and Head, Department of Mathematics welcomed all the faculties, University representative, subject experts, special invitees, industrial experts and alumni for this board of study meeting.

The Current syllabi for

- M.Sc Mathematics (Core, Allied, extra disciplinary papers)
- Value added course


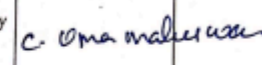
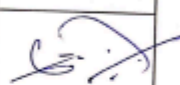
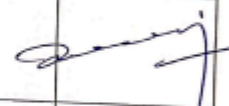
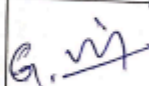



were approved by the board members.

In addition to this the following changes have been incorporated.

- As, By the suggestion given by Controller of Examinations Research methodology paper has been introduced for PG students.
- By the Guidance given by the Principal following Soft skill papers for M.Sc were introduced by the department to face the competency of the students
  - Semester – I : Communication Skills
  - Semester – II : Quantitative Aptitude
  - Semester – III : Analytical Reasoning
  - Semester – IV : Personality Development
- Elective paper Wavelets in Semester II has been shifted to Fourth Semester and Financial mathematics Using R in Fourth semester elective paper shifted to First semester

Both the syllabus and the changes have been approved by the board members .

The Following members were present for the meeting in the Seminar hall – I(Offline mode)

S.NO	Members of the Meeting	Designation	Signature
1.	<b>Chairman</b> Prof. R. Venkataramanan	Associate professor & Head, PG & Research Department of Mathematics, DG Vaishnav College, Chennai.	
2.	<b>University Nominee:</b> Dr. C. Uma Maheswari,	Assistant Professor, Ramanujan Institute for Advanced Study in Mathematics, University of Madras, Chennai.	
3.	<b>Subject Expert:</b> Dr.K.A.Venkatesh,	Adjunct Professor, IIT-B, India. Professor of Mathematics & Computer Science, Myanmar Institute of Information Technology, Mandalay, Myanmar	
4.	<b>Subject Expert:</b> Dr. T. Thulasiram	Associate Professor Department of Mathematics A. M. Jain College Chennai 600061	
5.	<b>Industrial Experts</b> Mr. G. Vignesh	Java / Node developer, Chennai.	
6.	<b>Alumni:</b> Dr. G. Uthra	Assistant Professor P.G & Research Department of Mathematics Pachaiyappas College,	
7.	<b>Alumni</b> Dr. S. Lavanya	Assistant Professor, Department of mathematics, Bharathi Womens College, Chennai.	
8.	<b>Alumni:</b> Dr G Sheeja,	Assistant Professor, Department of Mathematics, Faculty of Engineering and Technology, SRM University, Kattankulathur Campus, Kattankulathur Kancheepuram Dt.,Tamil Nadu, INDIA.	

9.	Prof. M. Devika	Associate Professor, PG and Research Department of Mathematics	<i>M. Devika</i>
10.	Dr. N. Jayanth Karthik	Associate Professor, PG and Research Department of Mathematics	<i>N. Jayanth Karthik</i>
11.	Dr. R. Sivaraman	Associate Professor, PG and Research Department of Mathematics	<i>R. Sivaraman</i>
12.	Dr. S. Radhakrishnan	Assistant Professor, PG and Research Department of Mathematics	<i>S. Radhakrishnan</i>
13.	Dr. B. Abirami	Assistant Professor, PG and Research Department of Mathematics	<i>B. Abirami</i>
14.	Dr. S.P. Vijayalakshmi	Assistant Professor, PG and Research Department of Mathematics	<i>S.P. Vijayalakshmi</i>
15.	Dr. S. Hariharan	Assistant Professor, PG and Research Department of Mathematics	<i>S. Hariharan</i>
16.	Dr. P. Usha	Assistant Professor, PG and Research Department of Mathematics	<i>P. Usha</i>
17.	Dr. S. Vaithyasubramanian	Assistant Professor, PG and Research Department of Mathematics	<i>S. Vaithyasubramanian</i>
18.	Dr. S. Mayilvaganan	Assistant Professor, PG and Research Department of Mathematics	<i>S. Mayilvaganan</i>
19.	Dr. S. U. Malini	Assistant Professor, PG and Research Department of Mathematics	<i>S. U. Malini</i>
20.	Lt. G. Somasundara Ori	Assistant Professor, PG and Research Department of Mathematics	<i>O. D.</i>
21.	Mr. P. Thirumal	Assistant Professor, PG and Research Department of Mathematics	<i>P. Thirumal</i>
22.	Mr. R. Krishna	Assistant Professor, PG and Research Department of Mathematics	<i>R. Krishna</i>
23.	Mr. S. Rajasekar	Assistant Professor, PG and Research Department of Mathematics	<i>S. Rajasekar</i>

**D.G. VAISHNAV COLLEGE (AUTONOMOUS)**

**CHENNAI – 600 106**

**Program Name: M.Sc. Mathematics**

**Curriculum and scheme of Examination under CBCS**

**(Applicable to the students admitted during the Academic Year 2021-2022 and Onwards)**

Semester	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
				CIA	ESE	TOTAL		
I	2121101	Core Paper I Abstract Algebra	6	40	60	100	3	4
	2121102	Core Paper II Real Analysis I	6	40	60	100	3	4
	2121103	Core Paper III Ordinary Differential Equations	6	40	60	100	3	4
	2121104	Core Paper IV Graph theory	6	40	60	100	3	4
		<b>Elective I</b> Formal Languages and Automata Theory	4	40	60	100	3	3
	2150101	<b>Soft Skills - I</b>	2	50	50	100	3	2
		<b>Total</b>	<b>30</b>	<b>-</b>	<b>-</b>	<b>600</b>	<b>-</b>	<b>21</b>
II	2121207	Core Paper V Linear Algebra	6	40	60	100	3	4
	2121208	Core Paper VI Real Analysis II	6	40	60	100	3	4
	2121209	Core Paper VII Partial Differential Equations	6	40	60	100	3	4
	2121210	Core Paper VIII Probability Theory	6	40	60	100	3	4
		<b>Elective II</b> Financial Mathematics Using R	4	40	60	100	3	3

		<b>Extra Disciplinary I</b> Data Structure and Algorithms	4	40	60	100	3	3
		<b>Internship</b>	-	-	-	-	-	2
		<b>Soft Skills - II</b>	2	50	50	100	3	2
		<b>Total</b>	<b>34</b>	-	-	<b>700</b>	-	<b>24</b>

III	2121313	Core Paper IX Complex Analysis - I	5	40	60	100	3	4
	2121314	Core Paper X Topology	5	40	60	100	3	4
	2121315	Core Paper XI Mechanics	5	40	60	100	3	4
	2121316	Core Paper XII Operations Research	5	40	60	100	3	4
	2121317	<b>Elective III</b> Number Theory and Cryptography	4	40	60	100	3	3
		<b>Extra Disciplinary II</b> Mathematical Economics	4	40	60	100	3	3
		<b>Project</b>	-	-	-	-	-	2
	2150301	<b>Soft Skills III</b>	2	50	50	100	3	2
		<b>Total</b>	<b>30</b>	-	-	<b>700</b>	-	<b>26</b>
IV	2121419	Core Paper XIII Complex Analysis - II	5	40	60	100	3	4
	2121420	Core Paper XIV Functional Analysis	5	40	60	100	3	4
	2121421	Core Paper XV Differential Geometry	5	40	60	100	3	4
	2121422	<b>Elective IV</b> Fluid Dynamics	5	40	60	100	3	3
		<b>Elective V</b> Wavelets	4	40	60	100	3	3

	2150401	<b>Soft skills IV</b>	2	50	50	100	3	2
		<b>Research Methodology</b>						

## **SOFT SKILLS-1**

### **COMMUNICATION SKILLS**

#### **Unit-1: Concept of Communications**

Introduction: Definition and Process of Communication - Forms of Verbal and Non-verbal Communication. Barriers of Communication: Communication Barriers and Overcoming Communication Barriers - Guidelines for Effective Communication. Business Writing: Direct and Indirect approaches to Business Writing - Five Main Stages of Writing Business Messages. **Exercise: Role Play, Square Talk Activity.**

#### **Unit-II: Written Business Communication**

External Communication: The Seven C's of Letter writing - Kinds of Business Letters - Business Reports and Proposals - Purpose of Business Reports. Internal Communication: Format and Principles of Writing Memos - General Warning - Cautions. **Exercise: Preparation of Reports on different issues.**

#### **Unit-III: Oral Communication**

Public Speaking: Types of Public Speaking - importance of Public Speaking. Power Point Presentation: Planning the Presentation - Delivering the Presentation - Developing & Displaying Visual Aids - Handling Questions from the Audience. Listening: Definition - Types of Listening Skills - Features of a Good Listener - Causes and effects of Poor Listening. **Exercise: Elocution and Extempore**

#### **Unit-IV: Behavioral Techniques**

Body Language: Facial Expressions - Body Posture - Gestures - Eye Movement - Touch and the use of Personal Space. Business Attire and Grooming: Different types of Attire - Guidelines for Business Attire. **Exercise: Power of Body Language, Charades.**

#### **Unit-V: Etiquettes**

Etiquettes: Greeting Etiquette - Corporate Etiquette - Telephone Etiquette - E-mail Etiquette - Meeting Etiquette - Netiquette - Personal Etiquette - Social Etiquette - Dining Etiquette. **Exercise: Introduction and Art of Conversation, Telephonic Activity.**

#### **REFERENCES:**

- Meenakshi Raman and Prakash Singh, Business Communication, Oxford
- Lesikar: Basic Business Communication, TMH
- David Irwin: Effective Business Communications, Viva- Thorogood.
- Rajendra Pal, J S Korlaha HI: Essentials of Business Communication: Sultan Chand & Sons, New Delh

## **SOFT SKILLS-2**

### **QUANTITATIVE APTITUDE**

**Unit – I:** Number System I & II – HCF, LCM, Decimal Fractions - Simplifications, Square roots and Cube Roots, Surds and Indices, Logarithms

**Unit – II:** Ratio, Proportion and Variation, Averages, Problems on Ages, Mixtures and Allegations, Percentages, Simple Interest and Compound Interest

**Unit – III:** Profit and Loss, Partnership – Chain Rule, Linear Equations, Areas and Volumes – Basics, Quadratic Equations, Time, Speed and Distance – basics, Time and work

**Unit – IV:** Time, Speed and Distance – intermediate & advanced, Pipes & Cistern, Problems on Trains, Boats & Streams, Height and Distance

**Unit – V:** Probability, Permutation & Combination – basics, intermediate & advanced, Calendar and Clocks.

#### **Reference Books**

1. R.S. Aggarwal, "Quantitative Aptitude for Competitive Examinations", S Chand Publisher, 20th edition (2013), ISBN-13: 978-8121924986
2. Arun Sharma, "How to Prepare for Quantitative Aptitude for the CAT", Mcgraw Hill Education, 6 th Edition, ISBN-13: 9789339205126
3. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations", Mcgraw Hill Education, 5th Edition, ISBN-13: 9789351343554
4. R.V Praveen, "Quantitative Aptitude and Reasoning", PHI, 2nd Edition (2013), ISBN- 978-81-203- 4777-9

#### Websites

1. <http://www.indiabix.com>
2. <http://www.geeksforgeeks.com>
3. <http://www.examveda.com>
4. <http://www.javatpoint.com>
5. <http://www.aptitudeschool.com>

### **SOFT SKILLS-3**

#### **ANALYTICAL REASONING**

**Unit – I:** Series – AP, GP, HP, Mixed progression, Set Theory, Conditional Probability, Areas and Volumes – intermediate & advanced, Geometry, Trigonometry, Stocks and Shares, Race and Games.

**Unit – II:** Data interpretation – Data tables, pie charts, bar charts, line graphs, mixed diagrams, Analogy, Classification, Series completion - Number Series, Letter Series, Coding & Decoding.

**Unit – III:** Blood relations, Symbol based statement conclusion, Cubes and Dices, Directions Sense Test, Visual reasoning – figure formation, pattern perceptions, mirror images, water images, paper cutting

**Unit – IV:** Analytical Reasoning, Syllogism, Puzzle test, Critical reasoning, Seating arrangements and cases, Alphabetical quibble, Number, Ranking and Sequence test

**Unit – V:** Deductive logic, Rule detection, Cause and effect, Statement and course of action, Statement and assumptions, Statement and arguments, Statement and conclusions.

#### **Reference Books**

1. R.S. Aggarwal, “Quantitative Aptitude for Competitive Examinations”, S Chand Publisher, 20th edition (2013), ISBN-13: 978-8121924986
2. Arun Sharma, “How to Prepare for Quantitative Aptitude for the CAT”, Mcgraw Hill Education, 6 th Edition, ISBN-13: 9789339205126
3. Abhijit Guha, “Quantitative Aptitude for Competitive Examinations”, Mcgraw Hill Education, 5th Edition, ISBN-13: 9789351343554
4. R.V Praveen, “Quantitative Aptitude and Reasoning”, PHI, 2nd Edition (2013), ISBN- 978-81-203- 4777-9

#### **Websites**

1. <http://www.indiabix.com>
2. <http://www.geeksforgeeks.com>
3. <http://www.examveda.com>
4. <http://www.javatpoint.com>
5. <http://www.aptitudeschool.com>

## **SOFT SKILLS-4**

### **PERSONALITY DEVELOPMENT**

#### **UNIT I Introduction to Personality Development**

The concept of personality - Dimensions of personality – Theories of Freud & Erickson-Significance of personality development. The concept of success and failure: What is success? - Hurdles in achieving success - Overcoming hurdles - Factors responsible for success – What is failure - Causes of failure. SWOT analysis.

#### **UNIT II Attitude & Motivation**

Attitude - Concept - Significance - Factors affecting attitudes - Positive attitude – Advantages –Negative attitude- Disadvantages - Ways to develop positive attitude - Differences between personalities having positive and negative attitude. Concept of motivation - Significance – Internal and external motives - Importance of self- motivation- Factors leading to de-motivation

#### **UNIT III Self-esteem**

Term self-esteem - Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem – Low self esteem - Symptoms - Personality having low self esteem - Positive and negative self esteem. Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviours - Lateral thinking.

#### **UNIT IV Other Aspects of Personality Development**

Body language - Problem-solving - Conflict and Stress Management - Decision-making skills - Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics –Good manners and etiquette.

#### **UNIT V Employability Quotient**

Resume building- The art of participating in Group Discussion – Facing the Personal (HR & Technical) Interview -Frequently Asked Questions - Psychometric Analysis - Mock Interview Sessions.

#### **Text Books:**

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill.
2. Stephen P. Robbins and Timothy A. Judge(2014), Organizational Behavior 16th Edition: Prentice Hall.

#### **Reference Books:**

1. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw-Hill 1988.

2. Heller, Robert. Effective leadership. Essential Manager series. Dk Publishing, 2002
3. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
4. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill. 2001
5. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
6. Pravesh Kumar. All about Self- Motivation. New Delhi. Goodwill Publishing House. 2005.
7. Smith, B . Body Language. Delhi: Rohan Book Company. 200

## **Research Methodology - PG**

**Unit 1:** Research Methodology: A review of the Fundamentals 1. Meaning of Research 2. Definitions of Research 3. Objectives of Research 4. Motivation in Research 5. General Characteristics of Research 6. Criteria of Good Research 7. Types of Research

**Unit 2:** The Research Problem and Review of Literature 1. Scientific Thinking 2. Selecting the Problem 3. Defining a Problem 4. Statement of a Problem 5. Delimiting a Problem 6. Evaluation of a Problem. 7. Meaning of Review of Literature 8. Objectives of Review of Literature 9. How to Conduct the Review of Literature

**Unit 3:** The Research Hypotheses 1. Meaning of Hypothesis 2. Definitions of Hypothesis 3. Nature of Hypothesis 4. Functions of Hypothesis 5. Importance of Hypothesis 6. Kinds of Hypothesis 7. Characteristics of a Good Hypothesis 8. Variables in a Hypothesis 9. Formulating a Hypothesis 10. Testing the Hypothesis

**Unit 4:** The Research Approach and Strategies 1. The Philosophical Background 2. The Qualitative Approach 3. The Quantitative Approach 4. The Mixed-Methods Approach 5. Criteria for Selecting a Research Approach 6. What are the Research Strategies? 7. Case Studies 8. Experiments 9. Ethnography 10. Phenomenology

**Unit 5:** Data Collection and Sampling 1. Questionnaires 2. Interviews 3. Focus Groups 4. Observation 5. Meaning and Definition of Sampling 6. Functions of Population and Sampling 7. Methods of Sampling 8. Characteristics of a Good Sample 9. Size of a Sample 10. The Sample Cycle

Recommended references:

1. Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press.
2. Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press.
3. Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press.
4. Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra.

5. Kothari, C. R. (1980). *Research Methodology: Research and techniques*, New Delhi: New Age International Publishers.
6. Kumar, R. (2011). *Research Methodology: a step-by-step guide for beginners (3rd edition)*. London, UK: TJ International Ltd, Padstow, Cornwall.
7. Leedy, P. D. (1980). *Practical Research: Planning and design*. Washington: Mc Millan Publishing Co., Inc.
8. Singh, Y. K. (2006). *Fundamental of Research Methodology and Statistics*. New Delhi. New International (P) Limited, Publishers.

